

is built from states, transitions, events and state transition components. Data flow components provide sampled-data capabilities. FSMs provide event-drive capabilities. Each component may include methods and attributes. A COG includes any type of component including COGs, graphical interconnections between components, and is used to graphically build a model of a control system. Top-down object decomposition is combined with bottom-up component-based synthesis from reusable software to build a control system. Commonly used object interfaces may be defined as reusable objects.] Mapping the computing resources of a computing device throughout the hierarchy of a control system is provided for modes, executable programs and threads of a processor. [Under mode mapping, the user graphically chooses in a simple and intuitive manner which components of the control system will run in which mode. Using executable mapping, the user chooses on which processor components will run.] Within a given processor, each component of a control system may be assigned to individual execution threads within that processor simply by naming a thread.

**In the Claims:**

Please cancel claims 26, 34, and 41.

**REMARKS**

Claims 26, 34, and 41 have been cancelled. Claims 23-25, 27-33, 35-40, and 42-45 are under consideration.

The Examiner objected to the drawings under 37 CFR 1.83(a). Claim 34 has been cancelled accordingly.

The Examiner requested that a previously submitted PTO-1449 and any non-patent literature or foreign document be resubmitted, since the documents were lost. The Information Disclosure Statement previously filed on February 26, 1999 is hereby resubmitted. However; no PTO-1449 nor any non-patent literature or foreign document is resubmitted as none was previously submitted.

The Examiner requested a new title. The title has been amended accordingly.

The Examiner objected to the abstract of the disclosure, as being greater than 150 words. The abstract has been amended accordingly.

The Examiner objected to claims 26, 34, and 41. Claims 26, 34, and 41 have been cancelled.

The Examiner rejected claims 23-30 and 45 under 35 U.S.C. 103(a) as being unpatentable over the commercial product Rational Rose 4.0 released in 1996 in view of Steinman et al. (USPN 6,259,958 hereinafter Steinman). Regarding claim 23, the Examiner stated that Rational Rose teaches using an OOCASE tool for defining a mode control system citing page 13 of Rose, and the method comprising receiving a plurality of components that represent the control system (Rose, page 7); choosing a subset of the components to correspond to the mode (Rose, page 6 and 7); identifying an intuitive name for the mode and its corresponding subset of components (Rose, page 7); and for each chosen component in the subset (Rose, page 6), indicating in a file corresponding to the component (Rose, page 199) that the component is active when the control system is in the mode (Rose, page 7 and 199), whereby when the control system is executing in the mode only the subset of the components that correspond to the mode will be active (Rose, page 177). The Examiner further stated that Rational Rose does not explicitly teach the context of a control system for controlling external devices/interfaces, but that Steinman teaches the tool set as supporting interfaces to external devices such as actuators and sensors and that it would have been obvious to combine the teachings of Rational Rose 4.0 with Steinman.

The Examiner failed to point out anything in the cited references that discloses or suggests defining a **mode**, as recited in claim 23. The list of design tools on page 13 of Rose does not list a **mode**. Pages 6 and 7 of Rose does not disclose or suggest choosing a subset of the components of the control systems to correspond to the mode, as recited in claim 23. Rose on pages 7, 199, and 177, do not disclose or suggest indicating a file corresponding to the component that said component is active when the control system is executing in the **mode** only the subset of the components that correspond to the **mode** are active. The Examiner did not point out anything in Steinman that discloses or suggest a **mode**. In addition, it would not be obvious to combine a control system of Steinman with the OOCASE tool of Rose. Page 3, lines 1-18, of the application discusses why the Rose tool does not provide sample-data processing needed for real-time control systems. Therefore it would not be obvious to use the Rose tool for real-time control systems. For at least these reasons, claim 23 is not made obvious by Rose in view of Steinman.

Claims 24-25 and 28-29 are ultimately dependent on claim 23, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth

above with respect to claim 23. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record. For at least these reasons, claims 24-25 and 28-29 are not made obvious by Rose in view of Steinman.

Regarding claim 27 the Examiner stated that in Steinman, Figure 3 the sensors and actuators are **receivers** and attached to the Application blocks in an Object Oriented system. Claim 27 is dependent on claim 23 and does not recite "receivers" but "received components". In addition, claim 27 recites a second mode and a third mode. The Examiner did not point out anything in the cited references that disclose or suggest a second mode and a third mode. For at least these reasons, claim 27 is not made obvious by Rose in view of Steinman.

Claim 30 is dependent on claim 23 and further recites switching from one mode to a different mode. The Examiner did not point out anything in Steinman or Rose that discloses switching modes. For at least these reasons, claim 30 is not made obvious by Rose in view of Steinman.

Claim 45 recites receiving a plurality of components. Rose on page 7 does not disclose or suggest the step of receiving a plurality of components as argued by the Examiner. Claim 45 further recites defining at least one logical executable name at each level in said multi-level hierarchy. Rose, page 7, discussing the ability to name a class as shown in the diagram "MyClass1", shows the ability to name one logical executable name at one level in a multi-level hierarchy, but not at each level of the multi-level hierarchy, as claimed. In addition, as discussed above, it would not be obvious to combine a control system of Steinman with the OOCASE tool of Rose. For at least these reasons, claim 45 is not made obvious by Rose in view of Steinman.

The Examiner rejected claims 31-44 under 35 U.S.C. 103(a) as being unpatentable over the commercial product Rational Rose 4.0 released in 1996 and Steinman et al. (USPN 6,259,958 hereinafter Steinman) as applied to claims 23-30 and 45 above, and further in view of Gretta.

Regarding claims 31 and 37, the Examiner stated that the limitation "defining a logical rate of execution at each level in the multi-level hierarchy" is taught by Gretta, Figure 8 and 9A stating that basic blocks are components of an executable image. The Examiner did not cite anything in the references that discloses or suggests a logical rate or defining a logical rate of execution. A logical rate of execution is not disclosed or suggested by Figures 8 and 9A of Gretta. In addition, as discussed above, it would not be obvious to combine a control system of

Steinman with the OOCASE tool of Rose. For at least these reasons, claims 31 and 37 are not made obvious by Rose and Steinman in view of Gretta.

Claims 32, 33, 35, and 36 are ultimately dependent on claim 31, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claim 31. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record. For at least these reasons, claims 32, 33, 35, and 36 are not made obvious by Rose and Steinman in view of Gretta.

Claim 38 recites receiving a plurality of components. Rose on page 7 does not disclose or suggest the step of receiving a plurality of components as argued by the Examiner. In addition, as discussed above, it would not be obvious to combine a control system of Steinman with the OOCASE tool of Rose. For at least these reasons, claim 38 is not made obvious by Rose and Steinman in view of Gretta.

Claims 39, 40, and 42-44 are ultimately dependent on claim 38, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claim 38. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record. For at least these reasons, claims 39, 40, and 42-44 are not made obvious by Rose and Steinman in view of Gretta.

In view of the amendments set forth above, it is respectfully submitted that the application is in condition for allowance and action to that effect is respectfully requested at an early date. If the Examiner feels that a telephone conference would expedite allowance of this application, the Examiner is invited to call the undersigned at (831) 655-2300.

Respectfully submitted,  
BEYER WEAVER & THOMAS, LLP



Michael Lee  
Reg. No. 31,846

P.O. Box 778  
Berkeley, CA 94704-0778  
(831) 655-2300

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